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TransCanada's Keystone XL Pipeline and its impact on Nebraska Water Quality

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The Keystone Pipeline entered the national stage in 2010 when TransCanada proposed an extension that went through the Nebraska Sandhills, an ecosystem which contains a large portion of the Ogallala Aquifer. This is not an issue to be taken lightly – the Sandhills and Ogallala Aquifer fulfill many of the functions noted in de Groot, Wilson, and Bouman's typology of ecosystem services. In this analysis, these two sides will converge into one research problem: exploring connections between the potential economic, social, and environmental effects of the Keystone XL Pipeline's presence in the Sandhills region of Central Nebraska.

The analysis shall begin with background information about the Central Nebraska Sandhills, an ecologically unique region that is home to the nation's largest aquifer, and the potential effects of the proposed pipeline in this area. The Veblenian dichotomy will then be applied to this issue. It is important to apply the Veblenian dichotomy to this research problem in order to find holistic policy measures that balance Nebraska's water quality and our nation's energy needs.

Overview: Nebraska Sandhills and Ogallala Aquifer

"Nebraska Sandhills" may suggest images of a desert, with bare sand dunes. Conversely, the state of Nebraska is often thought of as being extremely flat and full of crops (not untrue for some areas of this vast state). The Sandhills are somewhere in between these two scenarios. Covering a wide portion of Central Nebraska, the Sandhills are a series of sand dunes anchored by prairie grass. Common Nebraska crops such as corn, soybeans, or wheat cannot always be cultivated here, but grass grows easily, making it home to over 500,000 head of grazing cattle. These cattle are eventually processed into the beef that Americans eat each day. The grass here acts not only as a food source for American's beef, but also as an anchor for the sandy hills – a

unique feature compared to most large sand dune areas. In addition to cattle, the Sandhills are home to over 700 unique species of vegetation; approximately 93 percent of these species are considered native to the region (UNL West Central Research and Extension Center, n.d.). Sandhill Cranes migrate to the area each year in huge numbers and depend heavily on this "stopover" site to keep the species alive and thriving (The Audubon Society, n.d.).

The Sandhills hold some freestanding water in the form of streams and lakes. However, they are intimately connected to a pivotal hydrological resource: the Ogallala Aquifer. The Ogallala Aquifer is the largest in the U.S. and spans a few different states; however, the biggest portion of the aquifer covers approximately 85 percent of the state of Nebraska (Seitz). It is important to note that Nebraska is not a small state – it is almost twice the square mileage of the state of Ohio.

The importance of the Ogallala Aquifer cannot be overstated. Approximately 82 percent of Nebraska residents who live within its borders depend on the aquifer for potable drinking water. The significance of the aquifer extends beyond Nebraska's borders as this resource is used to irrigate almost all the crops grown in this area. Nebraska's agricultural products are consumed daily, nationwide: flour, bread, high fructose corn syrup, ethanol, and feed for livestock such as pigs, cattle, chickens, and others. It is estimated that the loss of the Ogallala Aquifer would result in a food and fiber loss of $20 billion. Loss of the aquifer would be a difficult recovery; it could take up to 6,000 years for the aquifer to be refilled naturally (Seitz).

The Ogallala Aquifer is, in part, so successful because of the Sandhills. The sandy soil composition helps the Sandhills act as a sponge, soaking up rainfall to be stored underground (Seitz). This quality makes the region ideal for soaking up rain water quickly and storing it for

consumption; however, these very qualities could wreak havoc if a contaminant were to be dispersed within the aquifer (such as oil).

With this information in mind, it is easy to see how this region fulfills several functions in de Groot, Wilson, and Bouman's typology of ecosystem services. The function that will be explored the most here is the regulation function of water supply – "Filtering, retention, and storage of fresh water" (de Groot, Wilson, & Boumans, 2002, p. 396). The possibility of an oil spill from the Keystone Pipeline presents a direct threat to the water supply function of this ecosystem, although the potential magnitude of the threat has been debated. Soil retention is another important regulation function as the grass growing in the Sandhills helps to anchor the dunes. As a home to a great number of native species, the area provides a habitat function by promoting biodiversity. By providing herds of cattle a place to graze and by providing irrigation water, the land assists in the production function of food – "Conversion of solar energy into edible plants and animals" (de Groot, Wilson, & Boumans, 2002, p. 396). Finally, the area supports some information functions, including a comprehensive research center dedicated to sustainable agricultural advancements, among other things (UNL West Central Research and Extension Center, n.d.).

Overview: Keystone XL Pipeline and Alberta Tar Sands

The Keystone pipeline has been in operation since 2010; the project has consisted of several construction phases. The goal of the pipeline is to move crude petroleum from Canada to the Gulf of Mexico where it can be processed into consumable oil and gas. In addition to the mining operations in Canada and the pipeline itself, the system consists of several pumping stations located throughout the Midwest. The latest expansion effort, the Keystone Pipeline XL,

caused a great deal of controversy when it was announced that the pipeline would be routed underground directly through the Nebraska Sandhills (Issitt, 2019).

The nature of the product being pushed through the pipeline further complicates the risk of a spill or leak. Tar sands or oil sands are deposits of sandy clay material that can be refined down to consumable oil through a very intensive and complex process (Issitt, 2019). The key ingredient in these sands is a compound called bitumen. Bitumen is much thicker, denser, and heavier than liquid oil and has the consistency of peanut butter – not readily able to be pumped through pipelines (Song, 2012). The bitumen is mixed with other chemicals and compounds to create a diluted liquid ("dilbit") that can be pumped down to a refinery. Once the diluted bitumen is at the refinery, the dilutants can be removed from the bitumen, which can then be developed into consumable oil or gas (Issitt, 2019).

The Potential Impact of a Pipeline Leak

Bitumen's chemical makeup is different from traditional crude oil – it sinks much more easily, and the pure bitumen is more corrosive and susceptible to separation from the dilutent materials. For example, in July 2010, a pipeline carrying diluted bitumen from Canada ruptured and spilled into Michigan's Kalamazoo River. Much like traditional oil, the diluted bitumen did indeed float. However, after some time, the dilutents evaporated, leaving behind the denser and heavier bitumen, which then sank. When the bitumen sinks under the water, it can become more difficult to clean up from spill sites. While it certainly is possible to clean up bitumen that has sunk, the cleanup process can be disruptive to the waterway's riverbed ecosystem (Song, 2012). An official timeline from the United States Environmental Protection Agency indicates the extent of the cleanup efforts – the EPA's involvement in the spill aftermath began in 2010 and

lasted approximately 6 years (U.S. Environmental Protection Agency, n.d.). Even if all bitumen were to be removed from waterways, further restoration efforts may still be needed.

The example above occurred in a freestanding waterway. What happens when bitumen leaks into the ground? The answer has not been widely studied. Recently, there have been two oil spills from the existing Keystone Pipeline infrastructure – one in South Dakota in 2017 (Knowles, 2019), and another in North Dakota in 2019 (MacPherson, 2019). Research opportunities for these spills beyond standard media reporting can be limited as they both occurred on private land. However, the United States Geological Survey has been researching and monitoring a plume of crude oil that was spilled into an aquifer in northern Minnesota in 1979. So far, the data show that as of 2016, the plume has only spread about 500 feet from the original spill site and appears to be stable. A hydrologist who works at the research site suggests that in the event of a bitumen leak into the Ogallala aquifer, the heavy bitumen might not be able to move very far in the sandy soil (Brocious, 2017). However, data also suggest that the interaction between the soil and naturally-occurring microbes that help to break down the crude oil may have negative environmental effects (U.S. Geological Survey, 2016).

Sandhills and Ogallala Aquifer: Economic, Environmental, and Social Importance

Economic: The Sandhills and Ogallala Aquifer are economically important to the state of Nebraska and its individual ranching households. This can be seen in a 2012 study of Nebraska's agriculture production and its impact on the state economy in 2010, conducted by the University of Nebraska's Agricultural Economics department. The analysis found the total economic impact of Nebraska agriculture to be $68.9 billion in business receipts – 40.7 percent of Nebraska's total output. Measures of Gross State Product (GPS), labor income, and employment numbers all came to around 25 percent of state totals. All of these numbers indicate

that agriculture accounts for a little more than 25 percent of goods and services produced within the state (Thompson, Johnson, & Giri, 2012).

It is notable that this same report explored these economic statistics by state regions, which allows some analysis within the Sandhills region. The findings showed that in regions located within the Sandhills (North, Central, South, and Southeast), agriculture accounted for 45 percent of regional output. The numbers also showed that approximately one third of this region's labor force were employed in the agriculture industry (Thompson, Johnson, & Giri, 2012).

Nebraska's agriculture sector is also important to the nation's food supply. Cash receipt figures provided by the United States Department of Agriculture's Economic Research Service rank Nebraska 4th of all states for total agricultural production in 2018 (United States Department of Agriculture Economic Research Service, 2020). What is perhaps more impressive, however, is Nebraska's agriculture productivity relative to the three states ranked ahead of it (California was first, followed by Iowa, then Texas). The table below shows these four states' total agricultural cash receipts, total population as estimated by the U.S. Census Bureau in 2018, and the average amount of agricultural cash receipts generated per person. Data indicate Nebraska to be have more agricultural productivity per person than the three states with greater dollar amounts of product (United States Department of Agriculture Economic Research Service, 2020), (United States Census Bureau, 2018).

State	**Cash Receipts in U.S. Dollars**	**Population**	**Cash Receipts per Person in U.S. Dollars**
California	$49,820,451,000	39,557,045	$1,259
Iowa	$27,473,604,000	3,155,070	$8,708
Texas	$21,979,362,000	28,995,881	$758
Nebraska	$21,229,624,000	1,934,408	$11,011

Sources: United States Department of Agriculture – Economic Research Center; United States Census Bureau

A lesser-known role of the Sandhills in Nebraska's economy is ecotourism related to the annual Sandhill Crane migration. Sandhill Cranes are one of only two native North American species of cranes, and they gather in enormous numbers each year along the Platte River in Central Nebraska (NASA, 2001). A 2014 study of Sandhill Crane migration estimates that ecotourism contributes anywhere from $25.1 to $53.1 million to the state economy each year. The link between the state's agricultural impact and ecotourism impact is closer than one might think. Part of the reason the Sandhills attract cranes in large numbers is because the corn residue from local crop fields provides an excellent food source for the cranes, who eat as much as they can in order to build fat reserves (Krapu, Brandt, Kinzel, & Pearse, 2014).

Environmental: The overview presented earlier outlined several important environmental functions of the Sandhills region and Ogallala Aquifer. These functions included providing potable water to increase crop and cattle production, which is directly related to the economic impacts discussed earlier. In fact, because a great portion of this unique ecosystem is privately owned by farmers and ranchers and used to create food products, the link to the economy is strong compared to other unique ecosystems, many of which exist as state parks or nature preserves. The region also encourages biodiversity as a home to over 700 unique species of vegetation.

As with the economic impact analysis, the importance of the annual Sandhill Crane migration cannot be ignored. The Sandhills region is a key destination for these cranes on the move, and historical data on the cranes' feeding patterns indicate that the presence of crop production in the region has contributed to the species' survival and stability (Krapu, Brandt, Kinzel, & Pearse, 2014). This demonstrates yet another indicator of the interdependence

between the Sandhills region and the Ogallala Aquifer. Without the water provided by the aquifer, crop production would not be stabilized; as a result, the Sandhill Cranes would need to find other sources of fat reserves or risk decreasing population sizes.

The Sandhills region provides many opportunities for environmental education and information. As mentioned earlier, the region is an annual destination for tourists to view the Sandhill Crane migration – one of the largest in the world. The region is also home to the Gudmundsen Sandhills Laboratory, a division of the University of Nebraska Extension Office. The facility focuses on research related to both the rich environmental resources within the Sandhills and local cattle ranching practices. According to their web site, the laboratory has pursued joint projects within the following areas: animal, range, soil, veterinary, economics, entomology, geology, hydrology, forestry, and wildlife (UNL West Central Research and Extension Center, n.d.). While much of this work is primarily related to the environment, it is easy to see in the range of projects that the laboratory produces contributions to economic and social spheres as well.

The Sandhills are home to several nature preserves and conservation areas (Chaplin, et al., n.d.); however, as noted earlier, much of the land is privately owned and used for farming and ranching operations.

Social: The Sandhills region is steeped in long family ranching legacies and a lifestyle centered wholly around the ranch. Nebraska farmers and ranchers take great pride in their agricultural output and the natural resources provided by the region. A qualitative study of New Mexico livestock ranchers revealed several important aspects of livestock ranching culture: a sense of place, an attachment to the land, and a commitment to preservation of open space (McSweeney & Raish, 2012). Much like the economic and environmental aspects of the

Sandhills are intertwined, traditional ranching culture and values go hand-in-hand with the environmental importance of the Sandhills. Farmers and ranchers here do not feel a sense of absentee ownership with the land and the goods it produces. Rather, they are committed to the health of the land – their social and economic livelihood depend on it.

Keystone Pipeline: Economic, Environmental, and Social Importance

Economic: Clearly, a project of such scope will indeed create jobs for U.S. workers. People will be needed to build and maintain the pipeline. Increased petroleum flow to refineries will increase demand for people to work in refineries and to transport the final product to its destination. The number of jobs that could result from the pipeline, however, are unclear and highly debated. TransCanada estimates that the pipeline will create approximately 9,000 direct and 42,000 indirect jobs for a total of 51,000 jobs (Blake, 2014). The State Department's final estimate for the Environmental Impact Study predicted a grand total of 42,100 jobs, direct and indirect (Parfomak, et al., 2014). At the time the Keystone XL Pipeline was proposed, the United States was recovering from a recession and job creation was a hot button issue.

The pipeline will also provide short- and long-term state and local tax revenues to the counties through which it extends. The U.S. Department of State's Environmental Impact Study estimates short-term tax gains of $66 million across all affected states during construction alone. These revenues are temporary and would be driven primarily by the construction camps in the areas around the project. When the project is completed, TransCanda will be required to pay property taxes for the first 15 years of the pipeline's operation. The Environmental Impact Study estimates that TransCanada will pay approximately $8.9 million total in property taxes per year, which would be a total tax revenue gain of $133.5 million (Alliston & et. al., 2019).

Environmental: The negative environmental impacts of the Keystone XL pipeline are both localized and global. Locally, as has been discussed, the potential for an oil leak in the Sandhills region and Ogallala aquifer could be detrimental. An oil leak has the potential to contaminate drinking water, creating economic and environmental inefficiencies when households have to drive elsewhere to buy bottled water. In fact, if a significant portion of the Ogallala Aquifer became unusable due to an oil spill, the economic benefits might be offset when local tax revenues are needed to build alternate infrastructures for potable drinking water. A decrease in crop production would have negative short-term and potentially long-term effects on individual household incomes, local and state tax revenue from decreased crop sales, and national food supply. This, in turn, could decrease the amount of food available for the Sandhill Crane populations which migrate annually to the area, which in turn could cause a decrease in species populations. Contaminated groundwater and soil may also be detrimental to the over 700 unique species of vegetation that live in the Sandhills region.

Globally, the impact of mining tar sands for petroleum is a hot issue. A report by the National Resources Defense Council reports evidence that Canadian tar sands mining may have negative environmental effects in Canadian air, waterways, and population health. Tar sands mining is an intensive process which has been found to release carcinogens into the local air, as well as carbon dioxide which may contribute to global warming – more carbon dioxide than other petroleum extraction methods such as drilling. Mining operations aren't the only source of pollution – greenhouse gases and toxic pollutants are also released into the air when petroleum is loaded into transport vehicles, such as railway cars. Diluted bitumen can cause catastrophic damage to the public and local environmental resources if a train car were to derail or explode. Bitumen is also much more corrosive than other types of crude oil, which increases the risk of

pipeline leaks, explosive railway accidents, and refinery accidents. The refinery process itself releases greenhouse gases that further contribute to global warming (Bailey & Droitsch, 2014). Building a pipeline could increase the rate of mining and refinery emissions.

While the tar sands industry may cause a great deal of environmental stress, the pipeline itself may actually help combat some of the negative impact. A pipeline is a low-emissions way to transport diluted bitumen from Alberta to the Gulf of Mexico, although some of the benefit could be offset by the emissions released during construction. According to Marcia McNutt – the current President of the National Academy of Sciences (National Academy of Sciences, n.d.) who famously reversed her opinion on the pipeline – strategic policies and standards surrounding production of the pipeline could be good for the environment in the long run. McNutt argues that the pipeline is a relatively low-cost way to move oil and, as a result, more funding can be devoted towards developing renewable energy sources. McNutt also believes the pipeline is an opportunity to set new and increased safety standards for the transport of crude oil (McNutt, 2014).

Social: The United States' view of other oil-producing countries is an important consideration in the construction of the Keystone XL pipeline. An analysis of public comment hearings in the state of Nebraska indicates that national security was the second most popular argument presented in pipeline supporter testimonies (Ordner, 2015). In the eyes of supporters, Canada is viewed as a "friendly" neighbor and ally compared to oil-producing countries in the Middle East or Venezuela. This argument can be linked to economic benefits – imported oil from countries with unstable governments could be more prone to price fluctuations, which can trickle down to American consumers (Blake, 2014). Many supporters of the pipeline view Keystone XL as a way to further reduce dependence on foreign oil.

With this in mind, it is interesting to note that Canada already supplies the bulk of the United States' petroleum imports – 4.42 million barrels per day, which is 49 percent of all U.S. oil imports. Mexico is the second highest producer of U.S. oil imports, at approximately 650,000 barrels per day or 7 percent of all U.S. oil imports. While the United States does indeed import a sizeable amount of oil from Saudi Arabia – approximately 530,000 barrels of oil per day – it would appear that the pipeline would serve less as a way to reduce *dependence* on Middle Eastern oil (the U.S. is clearly more dependent on Canada) and more as a social-political tool, centered around even more consumption of oil from "friendly" countries (U.S. Energy Information Administration, 2020). However, it is possible that the additional oil transported by the Keystone XL pipeline will not be sold to the United States – it could be shipped to overseas markets (Parfomak, et al., 2014).

Veblenian Dichotomy Analysis

The Veblenian Dichotomy can be applied to the environmental, economic, and social impacts of both the Keystone XL pipeline and the Nebraska Sandhills natural resources. The analysis that follows demonstrates that ceremonial and instrumental concerns span all three categories studied above.

Ceremonial – pipeline

- Social - Construction of the pipeline provides more access to Canadian oil. This would further align the United States' oil consumption with a country perceived as "friendly" relative to the Middle East and Venezuela. (Social)
- Social, Environmental - TransCanada states that pipelines are the safest and most environmentally friendly way to transport oil (TC Energy, n.d.). There are indirect economic benefits from safety – oil leaked into the ground is revenue lost.

Instrumental – pipeline

- Economic - The pipeline extension will create jobs, particularly for unionized construction workers looking for living wages (Ordner, 2015).
- Economic - The crude oil transported and refined by the pipeline system is necessary at least in the short run to keep our country running while alternative, renewable sources of energy are developed to fulfill long-run needs (Blake, 2014).
- Economic - The construction and presence of the pipeline extension will provide millions of dollars of tax revenue to Nebraska's state and local governments (Alliston & et. al., 2019).
- Economic, environmental, social - With strategic policies and guidelines in place, construction of the pipeline could actually free up financial resources to be devoted to development of renewable energy sources, making it a wise choice in the long-run (McNutt, 2014).
- Economic, environmental - Decreases the need to transport oil via railway or roadway both options that will contribute additional pollutants to the environment. Pipelines are also a lower cost option (McNutt, 2014).

Ceremonial – Sandhills & Ogallala aquifer

- Environmental - The Sandhills are one of the most unique ecosystems in the world (NASA, 2001).
- Environmental - The Sandhills are a National Natural Landmark (National Park Service, n.d.).
- Environmental - The Ogallala aquifer is the largest in the United States (Mandler, 2017)

- Environmental - The Sandhills are the largest sand dune formation in North America (NASA, 2001).

Instrumental – Sandhills & Ogallala Aquifer

- Economic, social - The Sandhills provide food for significant portion of America's beef (UNL West Central Research and Extension Center, n.d.).
- Environmental - The Sandhills provide home for over 700 unique species of vegetation (UNL West Central Research and Extension Center, n.d.).
- Environmental, economic, social - The Sandhills and Ogallala Aquifer work together to provide potable drinking water for Nebraska residents (Seitz).
- Economic, environmental - The Sandhills and Ogallala Aquifer work together to provide an irrigation source for America's corn, soybeans, and wheat (Seitz).
- Environmental - The Sandhills are an important "stopover" location for Sandhill Cranes, and destruction of this area could put the species in danger. Cranes stop here to feast on leftover corn from nearby harvested fields, and the consistency of this resource has helped the species remain in strong numbers (Krapu, Brandt, Kinzel, & Pearse, 2014).
- Environmental - The Ogallala Aquifer is part of a greater ground water network that spans several agricultural midwestern states (Seitz). Based on current research, an oil spill plume in the Ogallala Aquifer is unlikely to spread far enough to compromise other nearby aquifers (U.S. Geological Survey, 2016), but the Aquifer's connection to the rest of the system is not one to be ignored.

Why Veblenian dichotomy matters in formulation of research problems

When TransCanada proposed the Keystone pipeline, they faced opposition from local landowners. The two sides took different approaches to the issue; one side focused primarily on

economic issues and national security, while the other focused on environmental and social issues. James Ordner from the University of Kansas analyzed dialogue and testimonies between both sides at four town hall meetings throughout Nebraska. Ordner's research, rooted in communication and sociological theory, notes that supporters of the pipeline will generally seek to offer a narrative that maximizes benefits and minimizes risks; opposition will seek to maximize risks and minimize benefits (Ordner, 2015).

While this benefit-risk approach may, on the surface, seem economically sound – and there is indeed value in viewing issues through a risk-reward lens – the narrative presented by each side present a clear divide between economic and ecological issues. Ordner's research found that supporter testimonies most frequently featured the following arguments, in order from most frequent to least: creation of jobs (economic), tax revenue provided by the pipeline (economic), reduction of dependence of "foreign" oil from the Middle East (national security), energy independence (national security), increased business with a "friendly neighbor/ally" (national security), benefit to national economy (economic), providing living wage jobs (economic), and the need for petroleum for decades to come (national security) (Ordner, 2015).

The opposition – for which there were far more testimonies – had about 50 percent more unique arguments present than the supporters of the pipeline. The largest two arguments stated in the public hearings were general concern about the health of the aquifer and general concern about the Sandhills. Both of these are primarily environmental, but could be perceived as economic in that the health of these resources is a major driver in crop and livestock production. Additional environmental arguments included concern about the oil industry's ability to safely monitor and contain spills (TransCanada was presented to be inexperienced at transporting diluted bitumen via pipelines; the BP oil spill was also mentioned). There was a strong call to

reroute the pipeline around the Sandhills, indicating that the opposition was not necessarily opposed to the pipeline and its economic benefits, but was focused more on the health of Nebraska's natural resources. Some social concerns regarding the pipeline were prominent as well. Landowners who would have had the pipeline routed through their land felt they had been treated unfairly and illegally by TransCanada, who threatened eminent domain in order to route the pipeline (Ordner, 2015).

It is interesting to note that the arguments presented by the opposition are centered on "caring activities" as defined by Jochimsen and Knobloch. Caring activities are those that support industrial activity by maintaining the environment and the personal relationships needed for workers to continue living their daily lives (Jochimsen & Knobloch, 1997). It is even more interesting to note that women's testimonies were particularly prominent within concerns about the environmental impact of the Keystone XL, giving additional credibility to Jochimsen and Knobloch's theory of caring activities, which states that most caring activities are carried out by women (Jochimsen & Knobloch, 1997).

This analysis is useful to examine. However, the rhetorical divide formed by TransCanada vs. landowners fails to account for the significant connections between economic, environmental, and social elements. The earlier breakdown of economic, environmental, and social elements of both sides demonstrated that it is impossible examine one without finding connections to others. When these points were then categorized into ceremonial and instrumental areas based on the Veblenian dichotomy, it was easy to see that both ceremonial and instrumental categories contained economic, environmental, and social concerns.

Research problems – or problems defined by the rhetoric of opposing sides, as in this case – are often limited in scope. It is easy to define a research problem that investigates the

economic impacts only, or the environmental impacts only. It is less easy to define a research problem that looks to the big picture of ceremonial and instrumental functions of the goods in question. While it may not be possible to design the perfect, holistic research problem, taking the Veblenian dichotomy into account can help researchers strategize their thinking to provide open avenues for exploration. There is nothing inherently wrong with developing a research study dedicated to the economic impacts of a new bitumen pipeline – but use of the Veblenian dichotomy can help researchers bring environmental and social considerations to the table to, at the very least, be posed for future questioning.

The Keystone XL Pipeline Today: What Happened?

After much opposition from local landowners and at the request of the State Department, TransCanada proposed an alternate route for the pipeline that mostly avoided the Sandhills and routed through northeast Nebraska instead. President Obama denied the plan; TransCanada then submitted a new plan for review. After some political scuffles in the state of Nebraska, the state sent its approval for the alternate route. President Obama then vetoed a congressional bill that would have allowed the Keystone XL to be built and ultimately went on to deny TransCanada's application to build the pipeline. However, upon election, President Trump resurrected the project and cleared the way for the pipeline to be built (The Canadian Press, 2017). Today, TransCanada has already begun preliminary construction work for the pipeline – but their success may not necessarily be guaranteed. Individual landowners along the route and individual counties in Nebraska can still attempt to block construction of the pipeline (Kelly, 2020). Because the approved route mostly avoids the Sandhills region, the argument has shifted from environmental concerns to social concerns about eminent domain.

While the Keystone XL pipeline has dominated recent debate surrounding the quality of the Ogallala Aquifer, there is a bigger issue at hand. Pumping from the aquifer has caused massive depletion in some parts of the aquifer and the related High Plains aquifer system (Frankel, 2018). Building a pipeline through the aquifer could indeed have negative environmental impacts in the event of a spill – but allowing groundwater pumping to continue at the current rate could have far more widespread economic, environmental, and social consequences. Local landowners and Nebraskans produced an incredible rally around their land and natural resources and were successful in pressuring TransCanada to reroute. But local groups must know that the battle cannot end here. The Ogallala Aquifer and Sandhills region are far too instrumental to our communities, our state, our nation, and our world to ignore.

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